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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,141	03/31/2004	Peter-Pike Johannes Sloan	MSFT-2901/306874.02	9186
41505 7590 11/30/2007 WOODCOCK WASHBURN LLP (MICROSOFT CORPORATION) CIRA CENTRE, 12TH FLOOR 2929 ARCH STREET PHILADELPHIA, PA 19104-2891			EXAMINER NGUYEN, PHU K	
			ART UNIT 2628	PAPER NUMBER
			MAIL DATE 11/30/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/815,141

Applicant(s)

SLOAN ET AL.

Examiner

Phu K. Nguyen

Art Unit

2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-10,12-19 and 21-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-9,12-18,21-27 and 29-32 is/are allowed.
- 6) ☒ Claim(s) 1, 10, 19, 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2300

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 10, 19, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over SLOAN et al. (PRT for Realtime Rendering in Dynamic, Low frequency lighting Environments) in view of Baum et al, and DALRYMPLE et al. (5,142,617).

As per claim 1, Sloan teaches the claimed "method for enhancing a Precomputed Radiance Transfer (PRT) mesh comprising a tessellation of triangles, said triangles comprising vertices and edges" (Sloan, page 531, column 1, section 5: Precomputing Radiance Self-Transfer). It is noted that Sloan teaches "subdivision of triangles" in this section but does not teach "dividing at least one triangle in the mesh, but not all triangles in the mesh, into at least two or more triangles apiece." Baum teaches the subdivision of triangles is only applied to certain triangles satisfied some conditions, but not all triangles in the mesh (Baum, page 56, subdivision; under the balancing conditions, only a selected elements are subdivided). Furthermore, Baum teaches "said dividing at least one triangle comprises dividing at least one edge and creating at least one new vertex and at least one new edge running from said vertex for said triangle" in figure 9. Although the cited references do not mention "sample a PRT vector at each vertex," however, it is well known that the triangle is represented by its vertices, and the

samples are made at the vertices before used in the interpolation to find the values for other points in the triangle (Dalrymple, column 5, lines 15-21; also the subdivision of the triangle in column 6, lines 34-61). It would have been obvious in view of Baum and Dalrymple to configure Sloan's subdivision as claimed because the subdivision of the triangles is only applied to a triangle which is not satisfied the mesh condition, to reduce the processing time in compare with the case of subdivision all the triangles.

As per claim 10, Sloan teaches the claimed "system for enhancing a Precomputed Radiance Transfer (PRT) mesh comprising a tessellation of triangles, said triangles comprising vertices and edges" (Sloan, page 531, column 1, section 5: Precomputing Radiance Self-Transfer). It is noted that Sloan teaches "subdivision of triangles" in this section but does not teach "a subsystem for dividing at least one triangle in the mesh, but not all triangles in the mesh, into at least two or more triangles apiece." Baum teaches the subdivision of triangles is only applied to certain triangles satisfied some conditions, but not all triangles in the mesh (Baum, page 56, subdivision; under the balancing conditions, only a selected elements are subdivided). Furthermore, Baum teaches "said dividing at least one triangle comprises dividing at least one edge and creating at least one new vertex and at least one new edge running from said vertex for said triangle" in figure 9. Although the cited references do not mention "sample a PRT vector at each vertex," however, it is well known that the triangle is represented by its vertices, and the samples are made at the vertices before used in the interpolation to find the values for other points in the triangle (Dalrymple, column 5, lines

15-21; also the subdivision of the triangle in column 6, lines 34-61). It would have been obvious in view of Baum and Dalrymple to configure Sloan's subdivision as claimed because the subdivision of the triangles is only applied to a triangle which is not satisfied the mesh condition, to reduce the processing time in compare with the case of subdivision all the triangles.

As per claim 19, Sloan teaches the claimed "computer-readable medium comprising computer-readable instructions for enhancing a Precomputed Radiance Transfer (PRT) mesh comprising a tessellation of triangles, said triangles comprising vertices and edges" (Sloan, page 531, column 1, section 5: Precomputing Radiance Self-Transfer). It is noted that Sloan teaches "subdivision of triangles" in this section but does not teach "instructions for dividing at least one triangle in the mesh, but not all triangles in the mesh, into at least two or more triangles apiece." Baum teaches the subdivision of triangles is only applied to certain triangles satisfied some conditions, but not all triangles in the mesh (Baum, page 56, subdivision; under the balancing conditions, only a selected elements are subdivided). Furthermore, Baum teaches "said dividing at least one triangle comprises dividing at least one edge and creating at least one new vertex and at least one new edge running from said vertex for said triangle" in figure 9. Although the cited references do not mention "sample a PRT vector at each vertex," however, it is well known that the triangle is represented by its vertices, and the samples are made at the vertices before used in the interpolation to find the values for other points in the triangle (Dalrymple, column 5, lines 15-21; also the subdivision of the

triangle in column 6, lines 34-61). It would have been obvious in view of Baum and Dalrymple to configure Sloan's subdivision as claimed because the subdivision of the triangles is only applied to a triangle which is not satisfied the mesh condition, to reduce the processing time in compare with the case of subdivision all the triangles.

As per claim 28, Sloan teaches the claimed "hardware control device comprising means for enhancing a Precomputed Radiance Transfer (PRT) mesh comprising a tessellation of triangles, said triangles comprising vertices and edges" (Sloan, page 531, column 1, section 5: Precomputing Radiance Self-Transfer). It is noted that Sloan teaches "subdivision of triangles" in this section but does not teach "said computer-readable instructions comprising instructions for dividing at least one triangle in the mesh, but not all triangles in the mesh, into at least two or more triangles apiece by dividing at least one edge and creating at least one new vertex and at least one new edge running from said vertex." Baum teaches the subdivision of triangles is only applied to certain triangles satisfied some conditions, but not all triangles in the mesh (Baum, page 56, subdivision; under the balancing conditions, only a selected elements are subdivided). Furthermore, Baum teaches "said dividing at least one triangle comprises dividing at least one edge and creating at least one new vertex and at least one new edge running from said vertex for said triangle" in figure 9. Although the cited references do not mention "sample a PRT vector at each vertex," however, it is well known that the triangle is represented by its vertices, and the samples are made at the

vertices before used in the interpolation to find the values for other points in the triangle (Dalrymple, column 5, lines 15-21; also the subdivision of the triangle in column 6, lines 34-61). It would have been obvious in view of Baum and Dalrymple to configure Sloan's subdivision as claimed because the subdivision of the triangles is only applied to a triangle which is not satisfied the mesh condition, to reduce the processing time in compare with the case of subdivision all the triangles.

Claims 3-9, 12-18, 21-27, 29-32 are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu K. Nguyen whose telephone number is (571) 272 7645. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272 7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phu K. Nguyen
November 28, 2007


PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2300